# Fact Sheet

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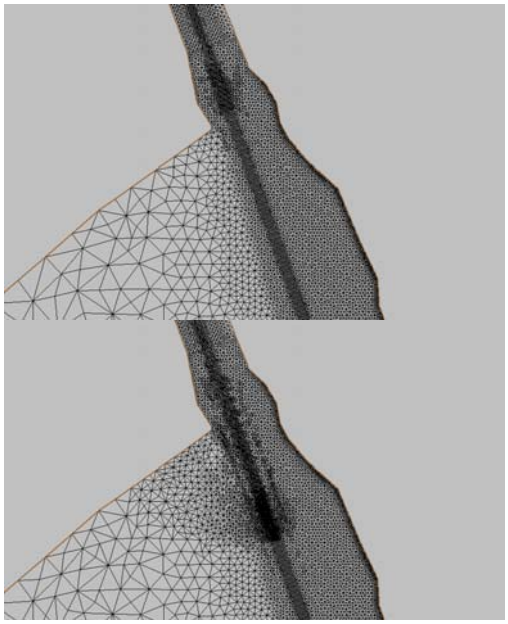
## Improved Numerical Modeling of Vessel Hydrodynamics and Sedimentation Effects on Waterways

**Purpose:** To make implementation of a numerical model for evaluating vessel effects on a waterway easier and faster. The hydrodynamic/sedimentation model will require less setup and computing time for evaluating navigation and environmental impacts.

**Background:** The Corps is charged with assessing environmental quality on its navigation projects. The effects of moving vessels must be quantified and mitigated. Corps investigators presently calculate the effects of a vessel sailing through a waterway using a numerical program developed by Berger and Stockstill, HIVEL2D. While this model has proven to be successful in addressing many vessel effects issues, it is computationally limited due to longer setup and computing times than are necessary. Also, the numerical program does not directly include sedimentation effects. This work will move the concept of a moving pressure field that currently exists in HIVEL2D into the new modern ADH (Adaptive Hydraulic) program. Furthermore it will make the vessel movement algorithm available to all shallow water models. In short, this work will cut the cost and time of studies for the impact of vessels in confined waterways.



**Facts:** Beginning in FY03, the Coastal and Hydraulics Laboratory began the development of a vessel movement library that can track several vessels within a numerical water body. This has been completed and is now available. The implementation of this vessel libary in combination with the ADaptive Hydraulics shallow water model will allow investigators to automatically produce accurate grids as these vessels move about in the waterway. This portion of the study has been completed and is undergoing testing.
The figure shows two views of the same area as a vessel move into a bay from a confined channel. The top graphic contains the grid while the vessel is above the bay and the second as the vessel enters the bay. The mesh is automatically refined as is necessary to accurately caputre the hydrodynamics associated with the vessel.

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